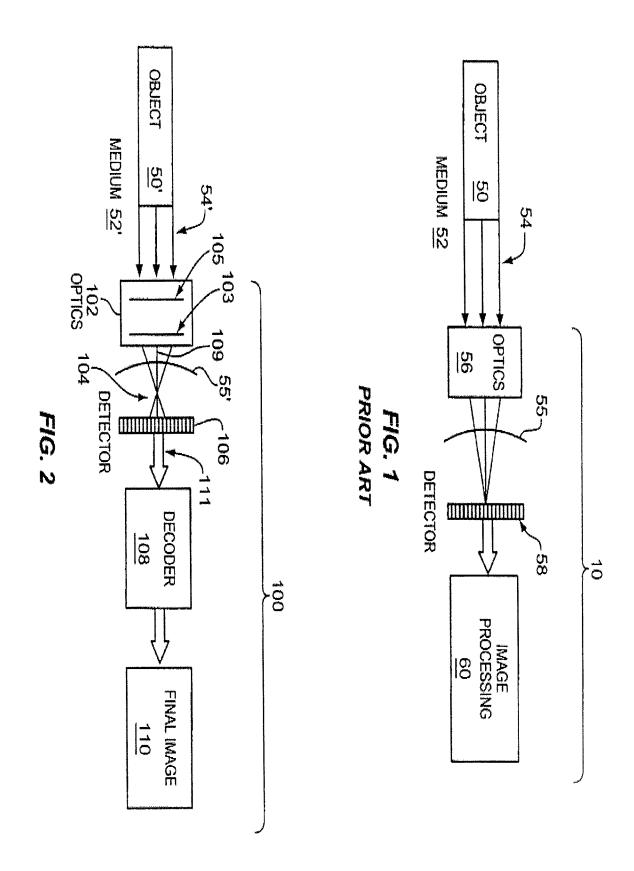
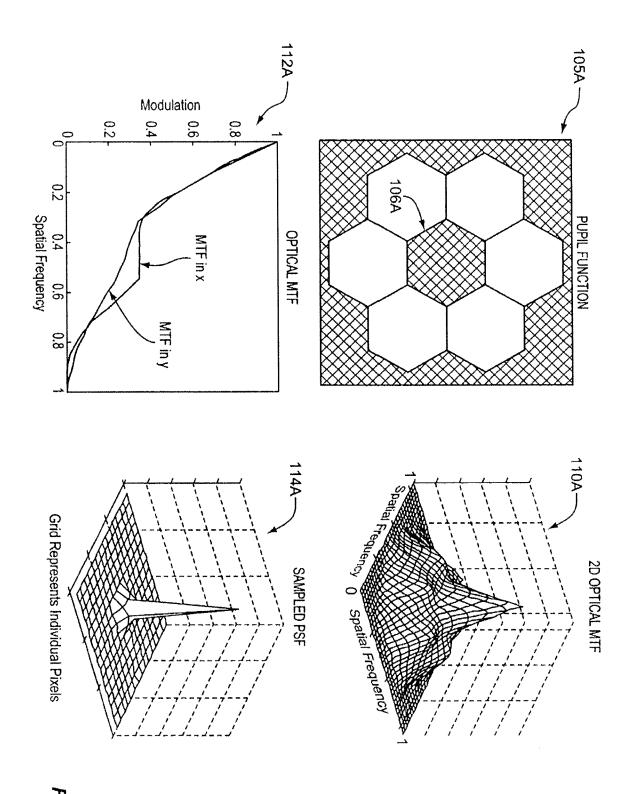
Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229

1/37

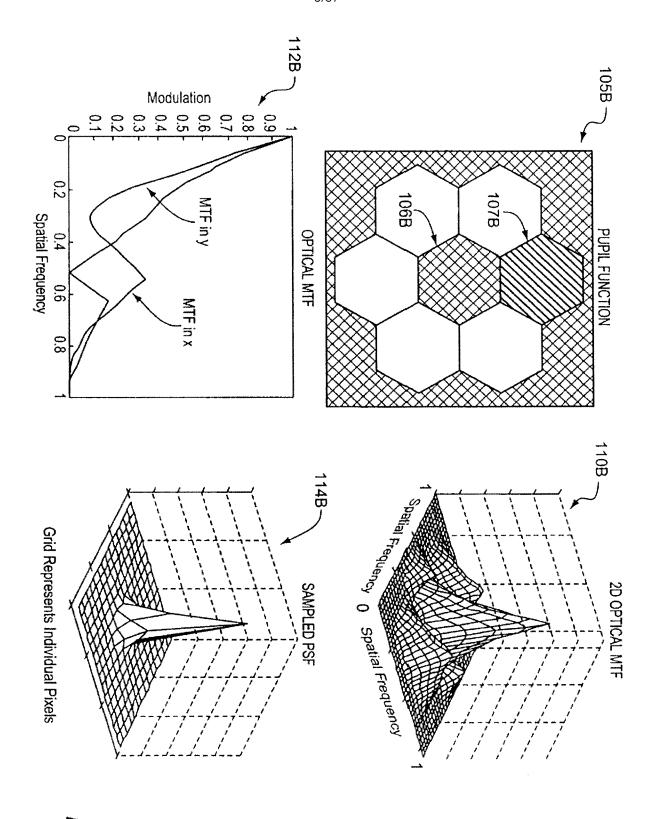


Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 2/37



7G. 3

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 3/37



Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 4/37

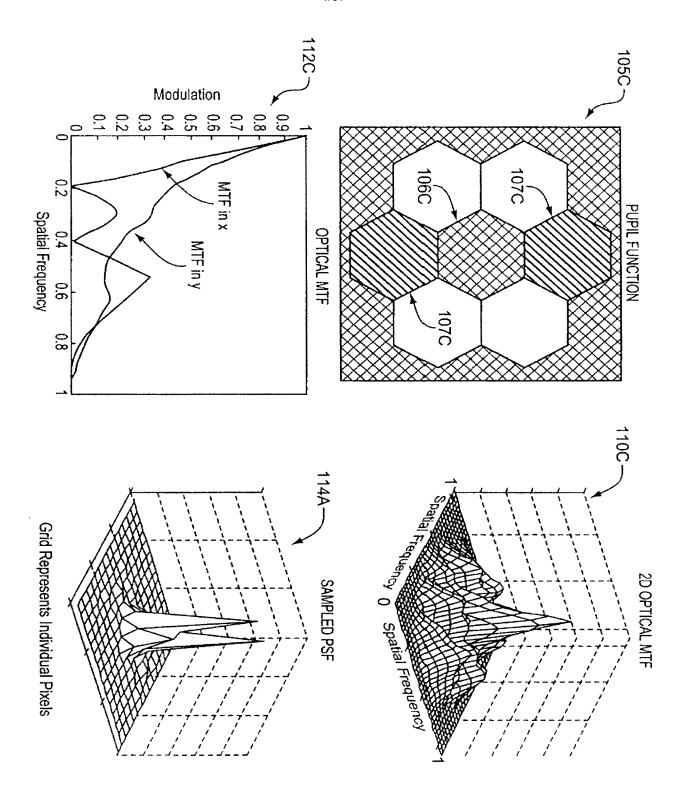
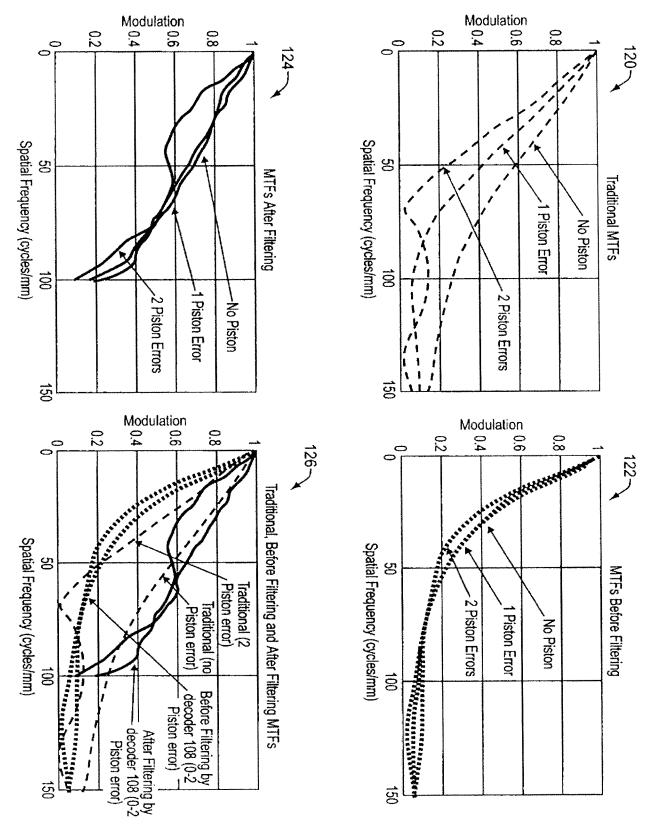


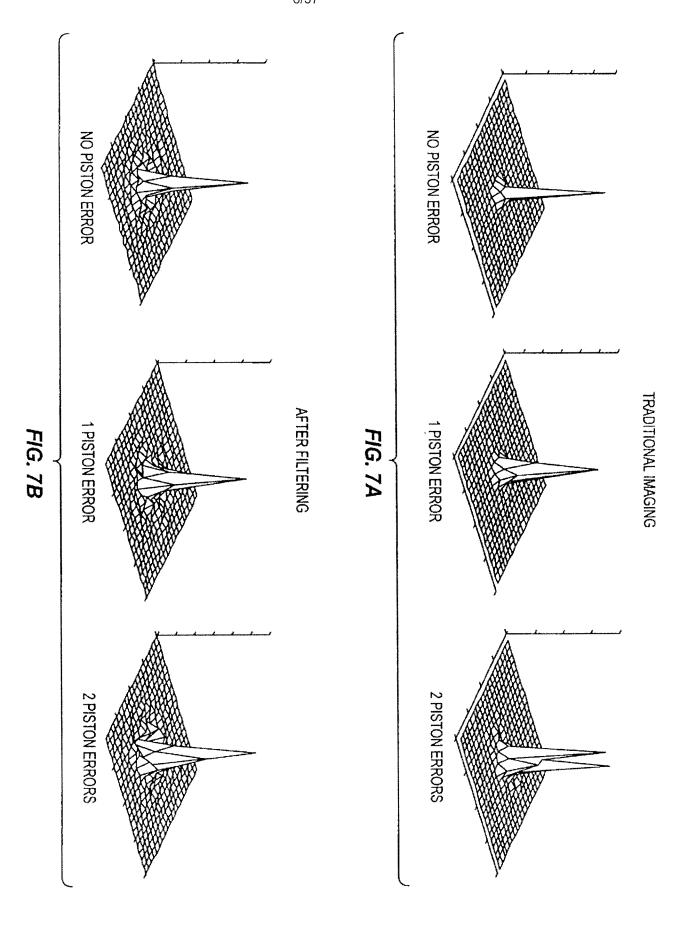
FIG. 5

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229

5/37

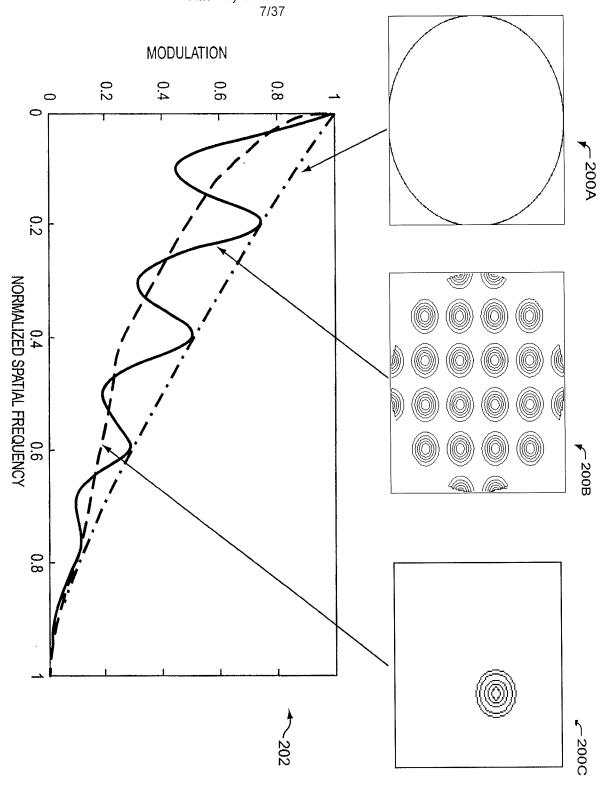


Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 6/37

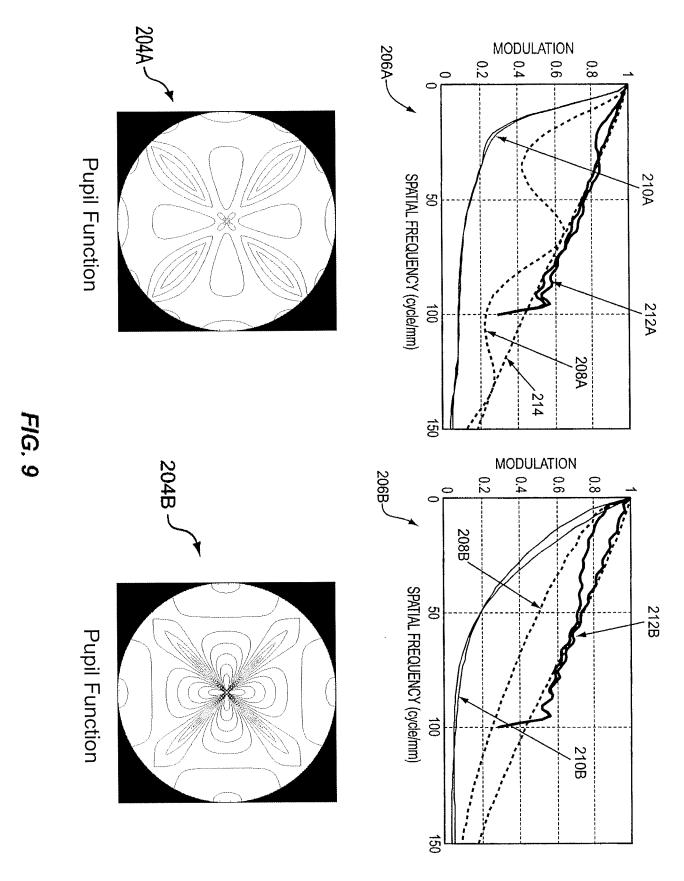


Title: METHODS FOR MINIMIZING ABERRATING EFFECTS IN IMAGING SYSTEMS

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229

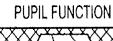


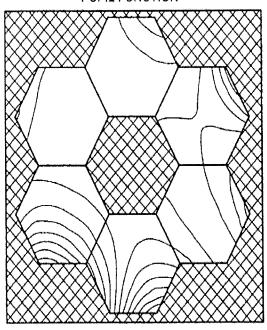
Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 8/37



Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 9/37

FIG. 10





FIRST ORDER OPTICAL PARAMETERS

2-meter collecting aperture 12-meter focal length 5-μm pixel size 100% fill factor 0.5 μm wavelength

Phase function is a Zernike polynomial with the following weights

#	Mathematical Form	Weight	#	Mathematical Form	Weight
0	1	0	11	$(4\rho^2 - 3)\rho^2 \cos 2\theta$	0.0379
1	ρ cosθ	0	12	$(4\rho^2 - 3)\rho^2 \sin 2\theta$	-0.1151
2	ρsinθ	0	13	ρ ⁴ cos4θ	0.5730
3	2p ² - 1	-0.1914	14	ρ ⁴ sin4θ	0.2412
4	$\rho^2 \cos 2\theta$	-0.3986	15	$(4p^4-12p^2+3)p \cos\theta$	-0.3050
5	ρ ² sin2 θ	0.0290	16	$(4\rho^4-12\rho^2+3)\rho \sin\theta$	-0.1698
6	$(3\rho^2 - 2)\rho \cos\theta$	0.1073	17	$(5\rho^{5}-4\rho^{3})\cos 3\theta$	0.0589
7	$(3\rho^2 - 2)\rho \sin\theta$	-0.0336	18	(5ρ ⁵ -4ρ ³)sin3θ	-0.0965
8	ρ ³ cos3θ	0.0496	19	ρ ⁵ cos5θ	0.7186
9	ρ ³ sin3θ	-0.0562	20	ρ ⁵ sin5θ	-0.5219
10	6ρ ⁴ - 6ρ ² +1	-0.2093			

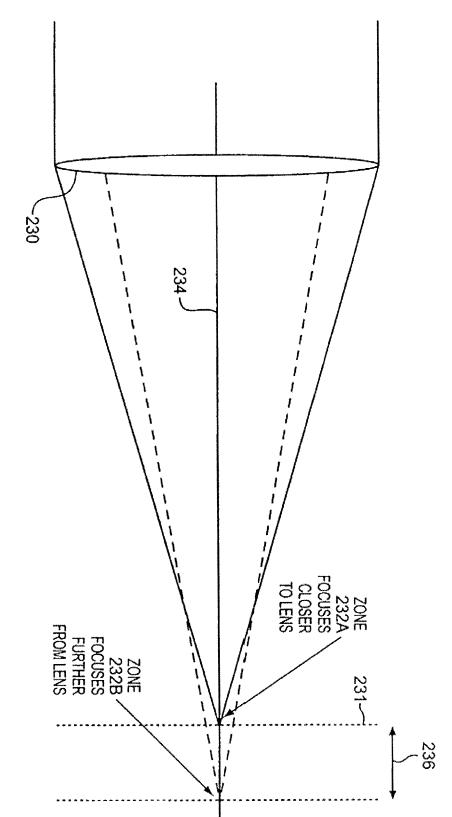
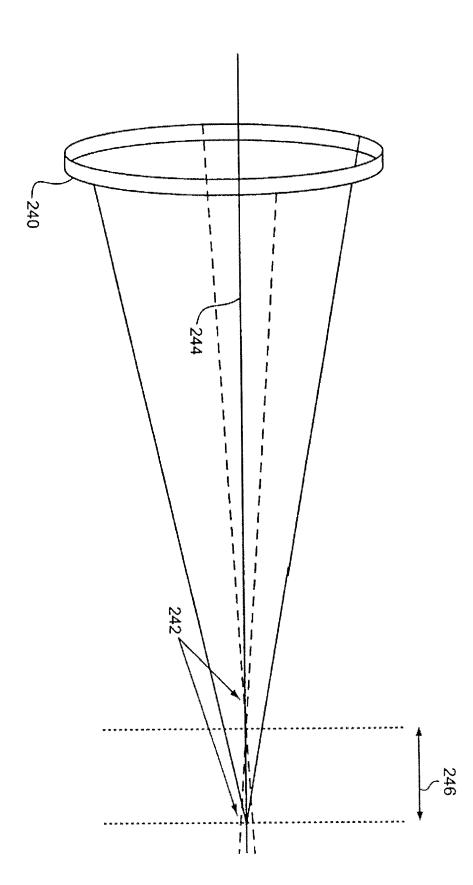


FIG. 11

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229

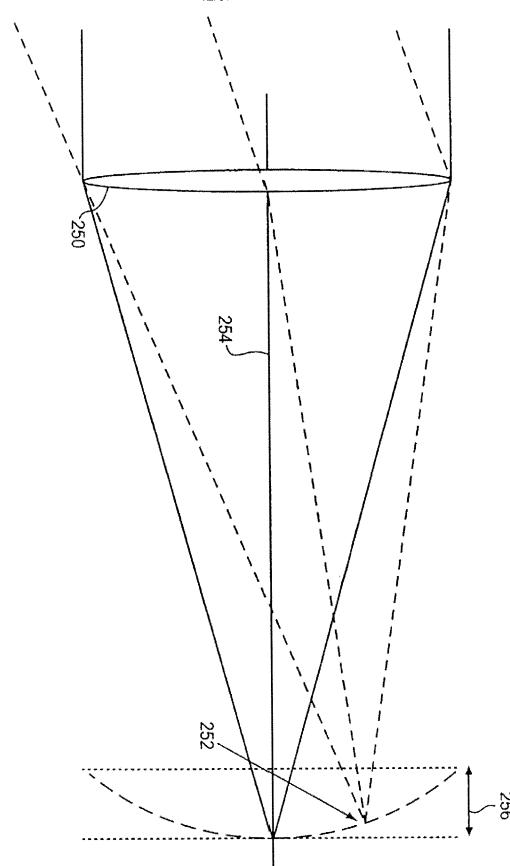
11/37



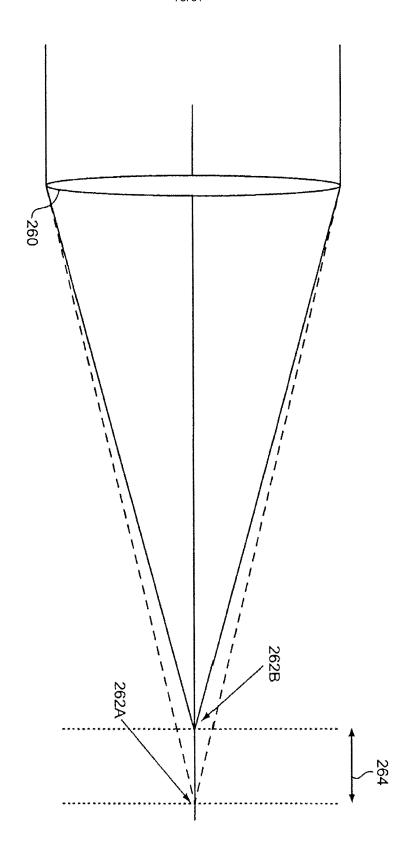
HG. 72

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 12/37





Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 13/37

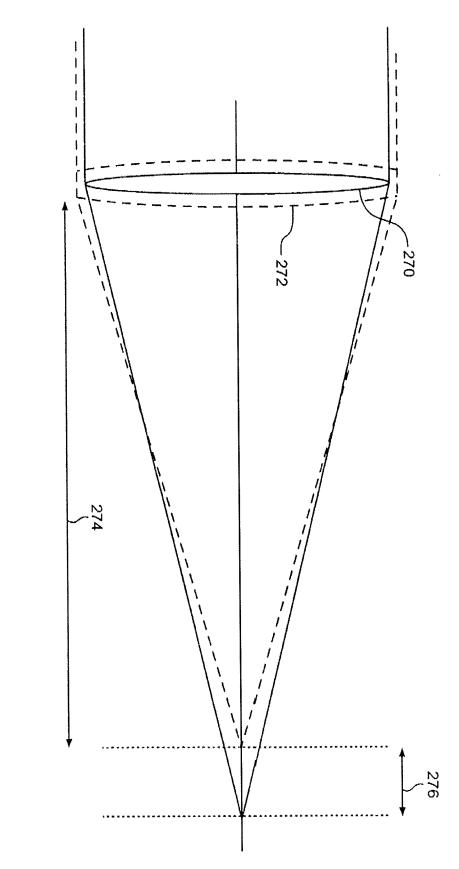


HG. 14

Title: METHODS FOR MINIMIZING ABERRATING EFFECTS IN IMAGING SYSTEMS

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229







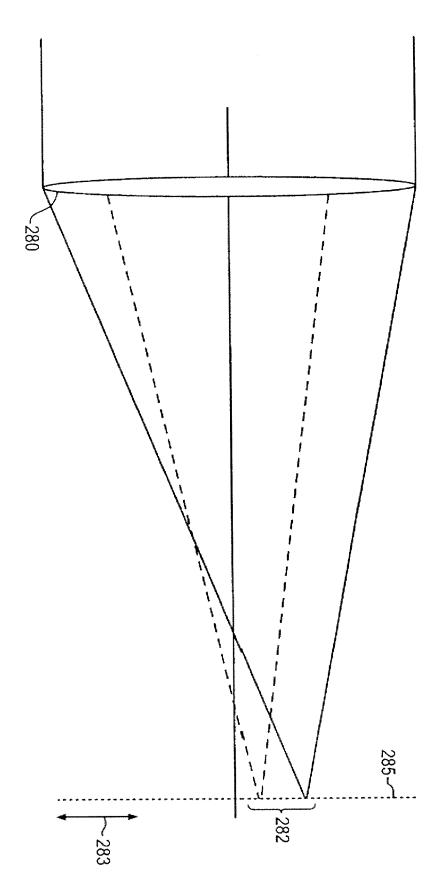
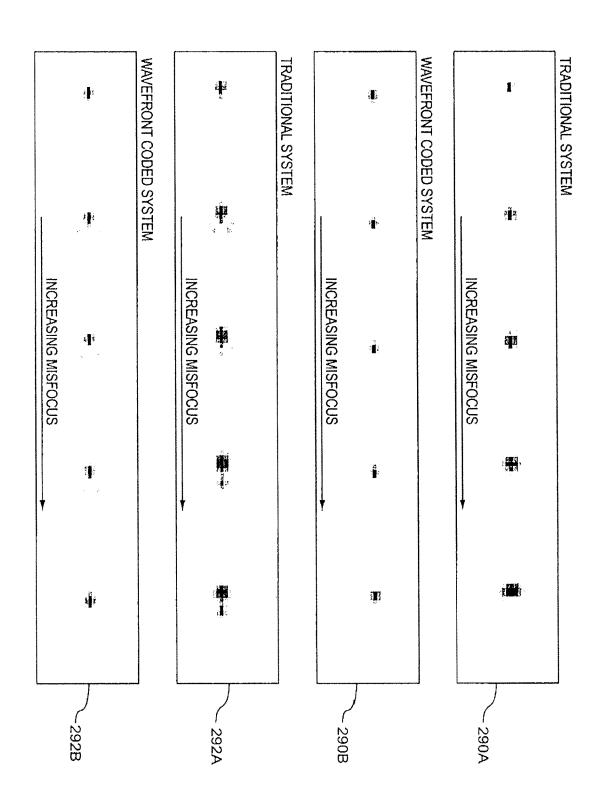


FIG. 16

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229

16/37

FIG. 17

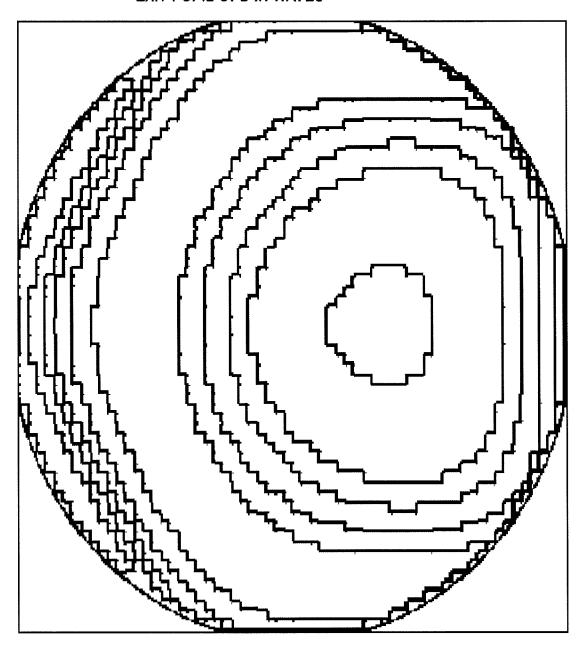


Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229

17/37

FIG. 17A

EXIT PUPIL OPD IN WAVES



Weights 0.3110 -0.0210 = [-0.1837 -0.3292 -0.0628]

 R^3 R^5 $R\cos(\theta) R^3\cos(3\theta)$ Functional Form = [

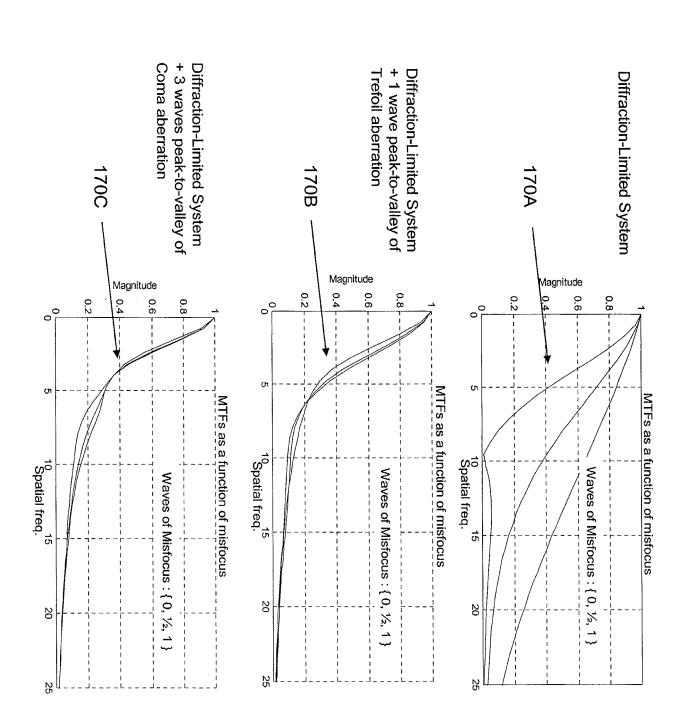
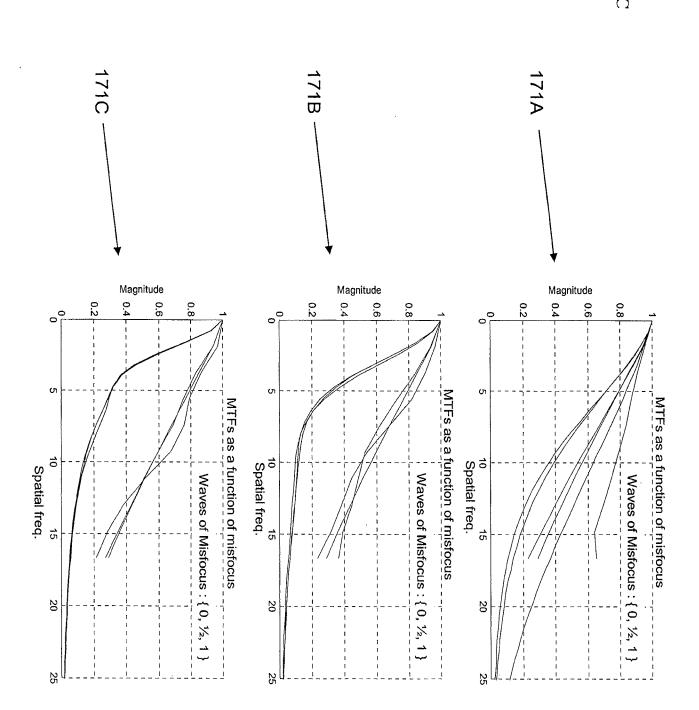
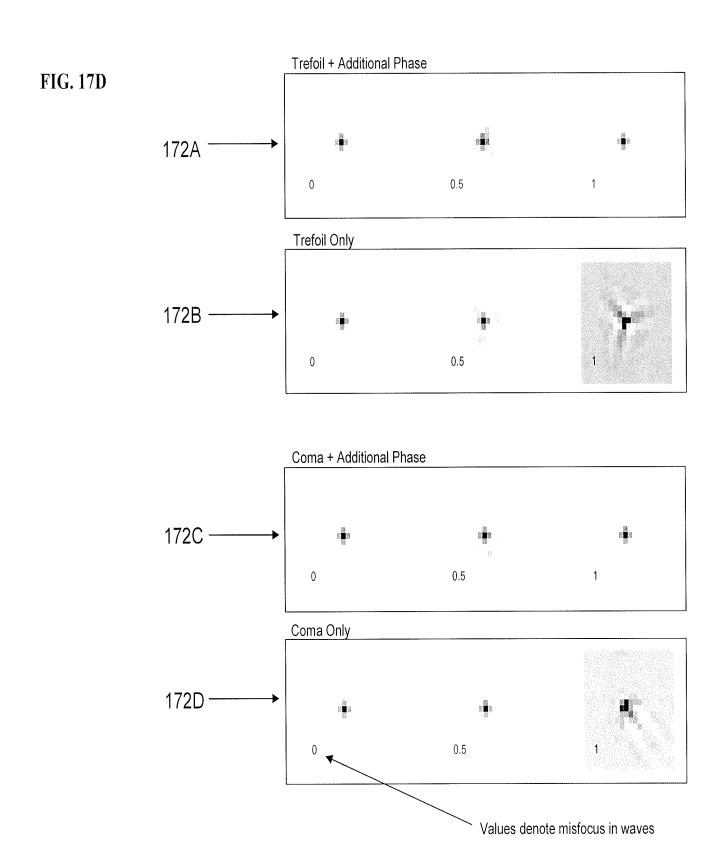


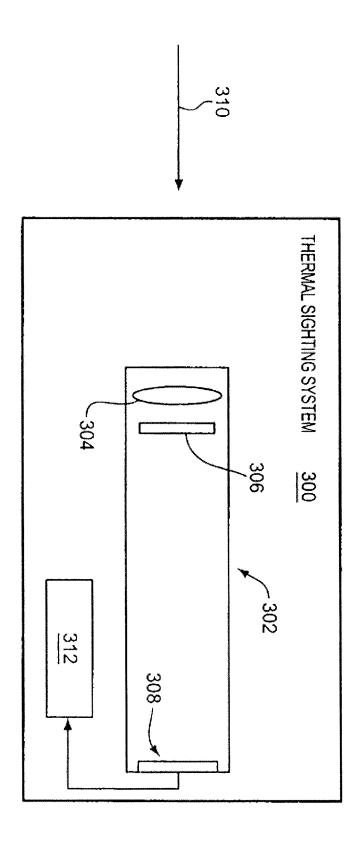
FIG. 17C



Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 20/37



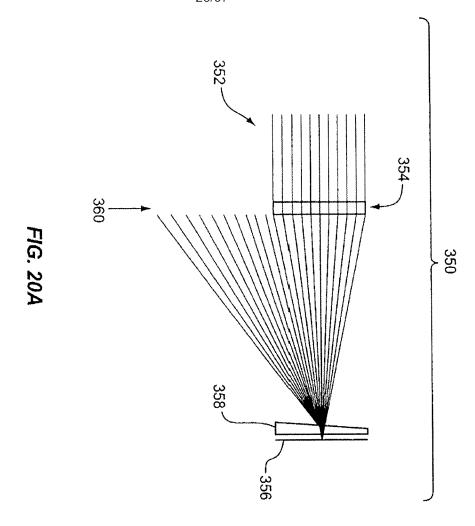


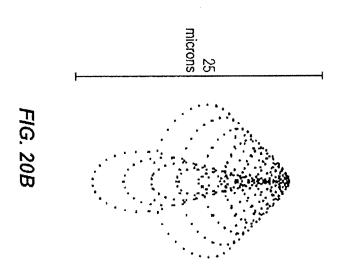


Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 22/37

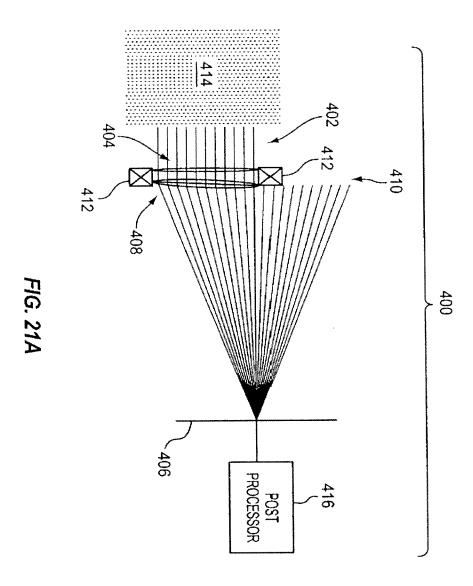
310A- $D(y) = 1.97 \times [0.1 \text{ y} - 0.18 \text{ y}^2 + 1.02 \text{ y}^3], 0 < y < 1$ Across the paths form given by: $C(x) = 3.9 \times 10^{-3} + 7.7 \times 10^{-5} \times^{2}, |x| < 1$ Along the paths form given by: 306A Constant profile path optics, the paths being defined along the sides of a square 309 Constant Profile Path Surface: 304A -302A F/# Wavelength: Focal Length: 320-51.1 mm 10jum Conic 1st 3rd 5th 7th 2.5 Odd Asphere Surface: Aspheric Terms: Material: FOV: -8.42 9.35 x 10⁻⁴ 2.61 x 10⁻⁴ 4.07 x 10⁻⁴ 9.00 x 10⁻⁵ Germanium Axial

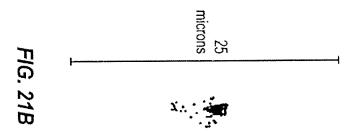
Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 23/37





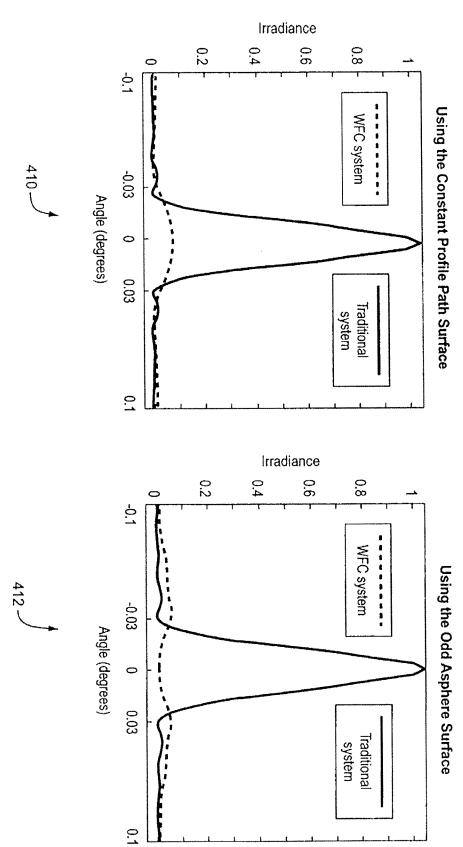
Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 24/37



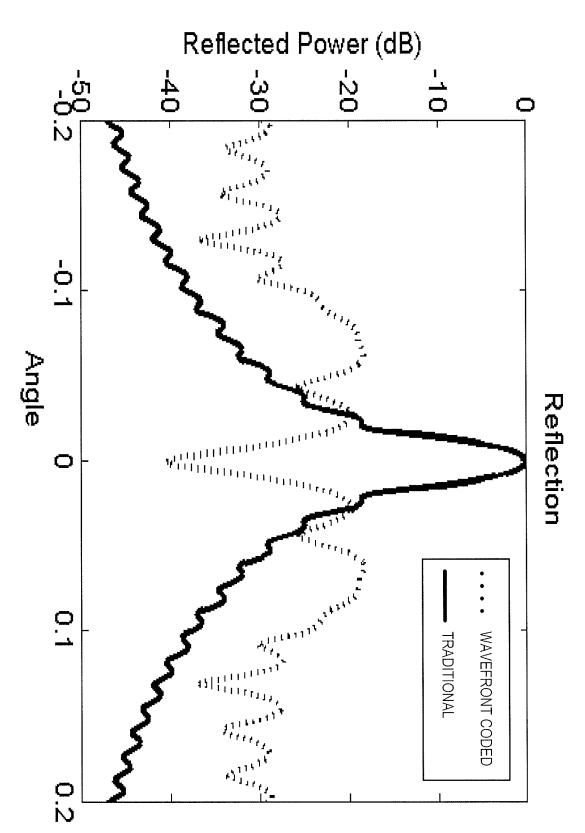


Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229

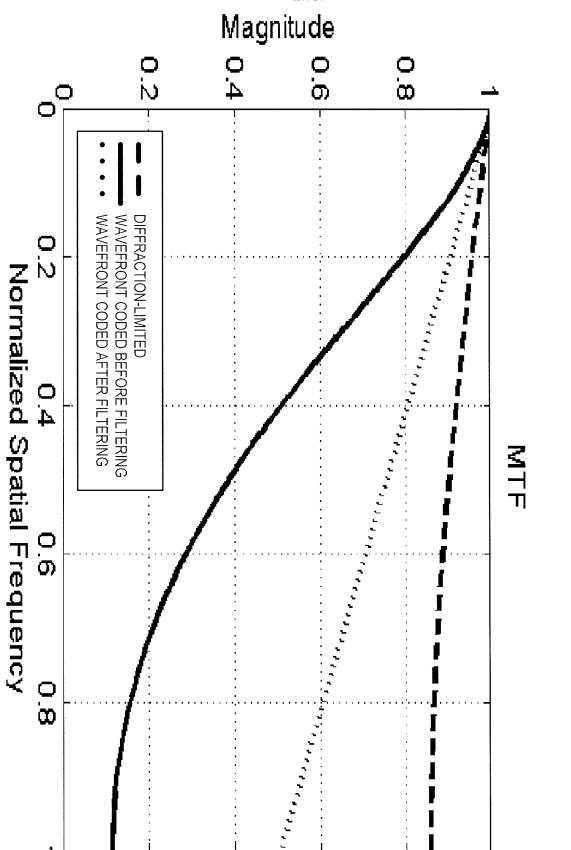






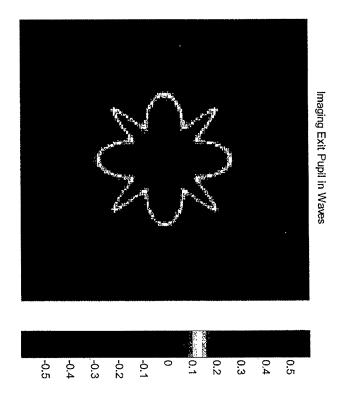


Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 27/37

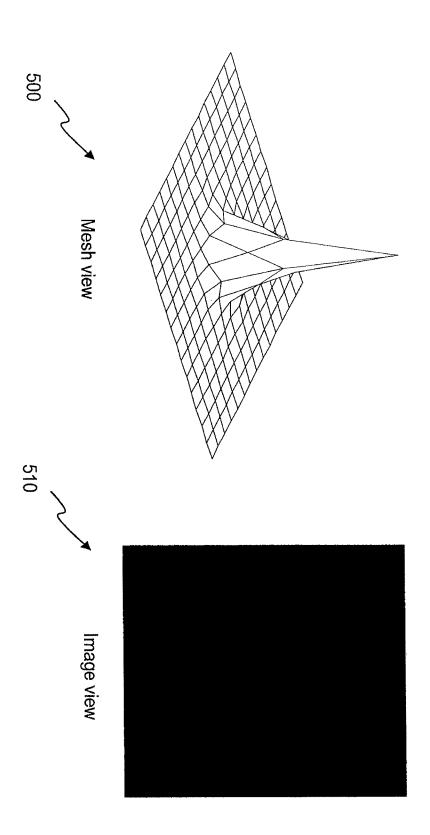


Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 28/37

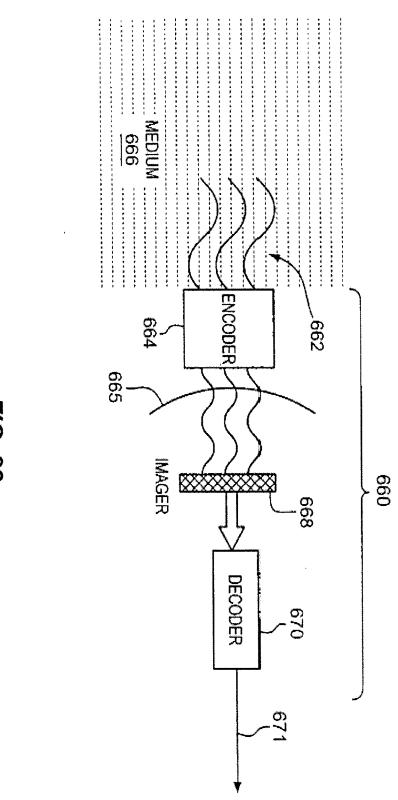
FIG. 220



Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 29/37

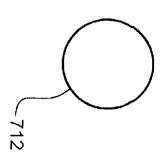


Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 30/37



1G. Z3

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 31/37



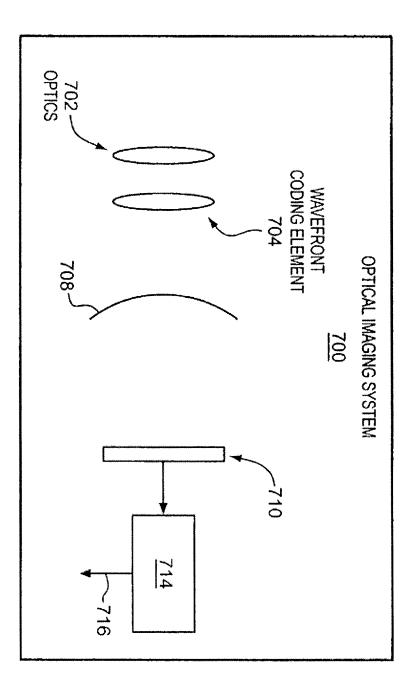
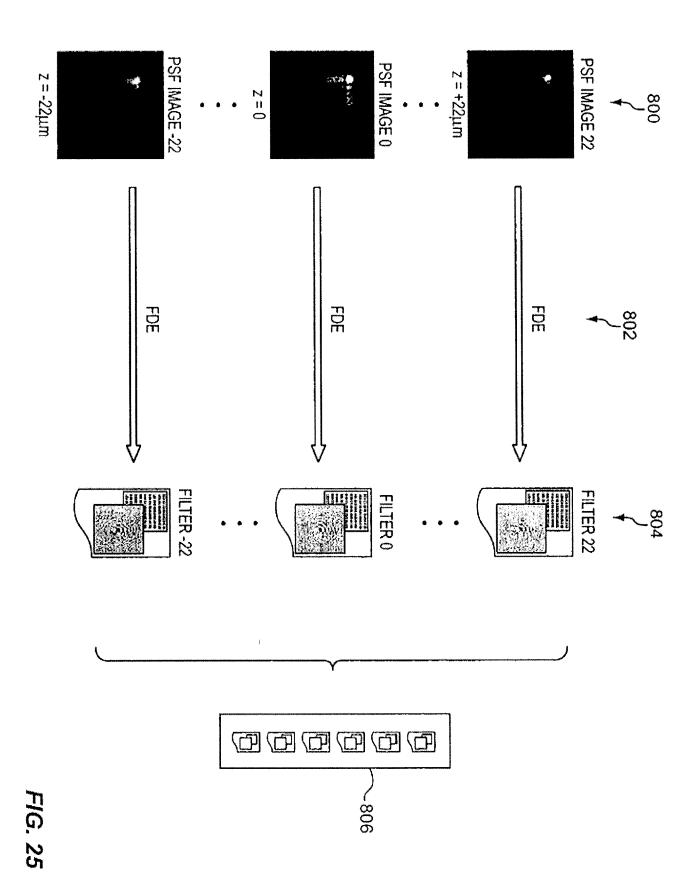


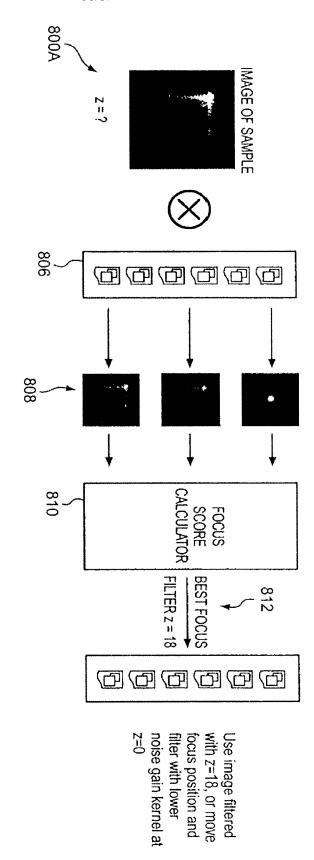
FIG. 24

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 32/37



Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229

33/37



Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 34/37

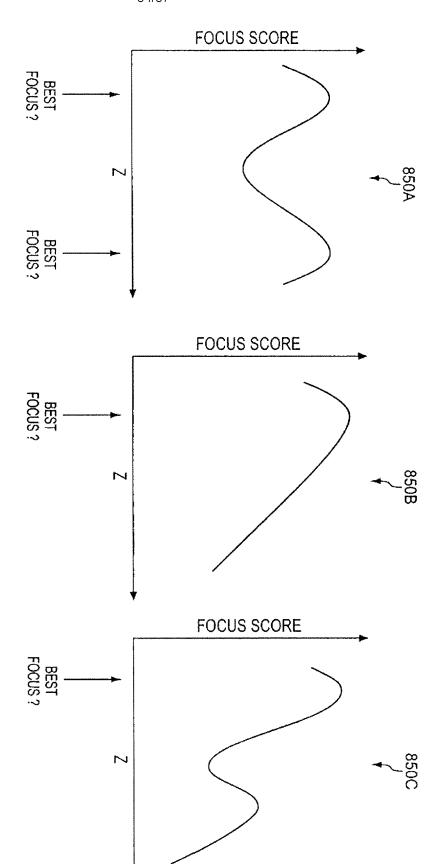
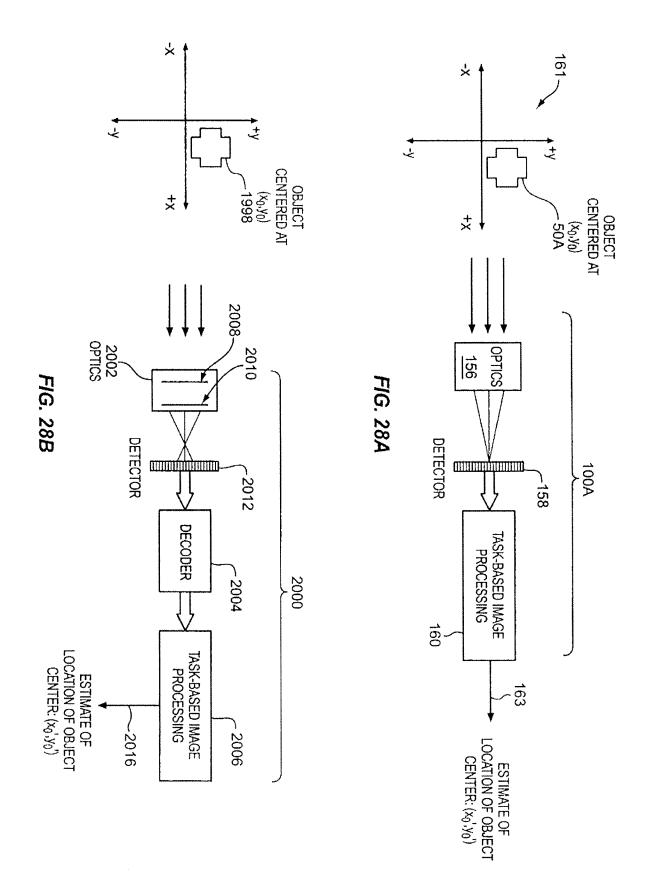
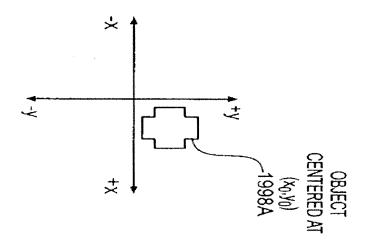


FIG. 2:

Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 35/37



Inventor: Edward R. Dowski Jr. et al Attorney Docket No: 420229 36/37



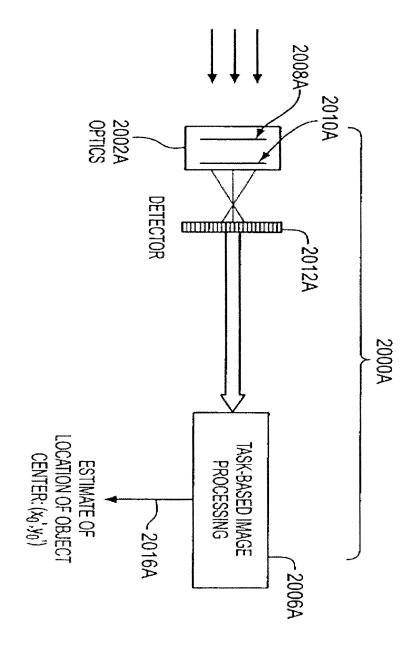


FIG. 28C

